

REMARKS

The indication that claim 8 includes patentable subject matter is acknowledged with thanks. In reliance thereon, claim 8 has been placed in independent form by adding the subject matter of claims 1, 6, and 7 thereto. Allowance of claim 8 is respectfully requested.

The Official Action objects to the form of claims 5-6. These claims have been amended and reconsideration and withdrawal of the objection are respectfully requested.

Claim 4 was rejected as anticipated by FUSSELL 4,023,071. Reconsideration and withdrawal of the rejection are respectfully requested.

FUSSELL discloses an arrangement in which a varistor and a Zener diode are connected in parallel. This in itself is not sufficient to obtain the result claimed by the Applicant, with reference to Fig 1 of the patent application, that "(it) will make it possible, when the voltage at the terminals of the varistor attains the avalanche value of the Zener diode, to continue to conduct the current until the blow-up power of the Zener diode is attained, ..." (emphasis added); see page 9, lines 10-13 in the English version of the PCT application.

Attached hereto please find a set of three drawings labelled case 1, case 2 and case 3 and drafted by the inventor. These drawings show that unless a proper selection of the Zener diode

and varistor is carried out, almost any combination of these two components doesn't lead to the result achieved by the invention.

In Case 1, for a given voltage, e.g.  $V_1$  as shown, at the terminals of the Zener diode and the varistor arranged in parallel, the first of the two components to conduct the current is the one having the lowest voltage threshold, i.e. the varistor (part a of the curve). Then, the Zener diode begins to conduct (increasing current for a constant voltage - part b of the curve), and reaches the same current as the one in the varistor (point P). The diode then fails in a few microseconds in a short-circuit (part c of the curve) and blows up.

In this arrangement, the diode lops the raising up voltage, but fails after a few microseconds when the varistor is conducting a very high current. This arrangement may be that of FUSSELL. It is of low interest because the residual voltage remains of high value.

In Case 2, the voltage threshold of the diode is lower and the varistor has a slope which is flatter than in case 1. In this arrangement, the varistor is the first component to be conductive (part a of the curve) and then the diode is conductive (part c of the curve). Thus the diode blows up at some hundreds amps (part e of the curve) and the varistor is conductive (part d of the curve). The residual voltage is acceptable in this arrangement but the varistor is only acting as a "spare-wheel" when the diode blows up, as the varistor is not conductive in

part c of the curve and could be disposed of for this part of the curve.

In Case 3, the arrangement is somehow similar to that of case 2. It differs therefrom in that the diode is selected to sustain a short-circuit. When the current is high, it is the diode which is conductive (part f of the curve). This arrangement is of low interest in that it doesn't use the property of the varistor to conduct high currents.

The arrangement proposed by the Applicant is different from those discussed above. With reference to the attached marked-up version of Fig. 1 of the patent application, basically, as mentioned above, the invention consists in a proper selection of the two components - the Zener diode and the varistor - in order that the varistor is still conductive after the avalanche voltage of the diode. On marked-up Fig. 1, point A represents the avalanche voltage of the diode and point BU represents the blow up power of the diode. Curves a and b are the voltage-current curves of the Zener diode and of the varistor, respectively.

As explained in the patent application, the varistor is the first component to be conductive (as in the three cases discussed above). The invention may be graphically defined by the fact that the curve of the varistor crosses the curve of the Zener diode in the (almost) vertical part of the curve of the Zener diode. In other words, the varistor and the Zener diode are selected so that point B of the varistor curve (which is at the

avalanche voltage of the Zener diode) is to the right of the short-circuit part of the curve of the Zener diode. By this arrangement, the varistor is conducting up to the avalanche voltage of the Zener diode. The varistor is at that time at point B and the Zener diode at point A. Point B is so far away to the right of point A that the varistor is much more conductive than the Zener diode (between points A and BU for the Zener diode, and points B and C for the varistor).

Present claim 4 is in line with what is shown on Fig. 1 of the application. The relative positions of the two curves as recited in claim 4 has the same technical meaning as the "crossing of curves" mentioned above.

Since FUSSELL does not disclose the varistor whose voltage-current curve is below a corresponding voltage-current curve of the arrestor until a certain current is reached at which the voltage-current curve of said varistor is above the voltage-current curve of the arrestor causing the arrestor to irreversibly short circuit, wherein the certain current is greater than a current at which the arrestor would short circuit if the varistor were not present, claim 4 avoids the rejection under §102.

Claims 5 and 14 were rejected as unpatentable over FUSSELL in view of VERMIJ 4,703,299 and claims 6-7 and 9 were rejected further in view of GIRARD 5,831,808 and TUROLLA et al. 4,646,037. Reconsideration and withdrawal of the rejections are respectfully

requested as these claims depend from claim 4 and are allowable therewith. The further references do not make up for the shortcomings of FUSSELL noted above.

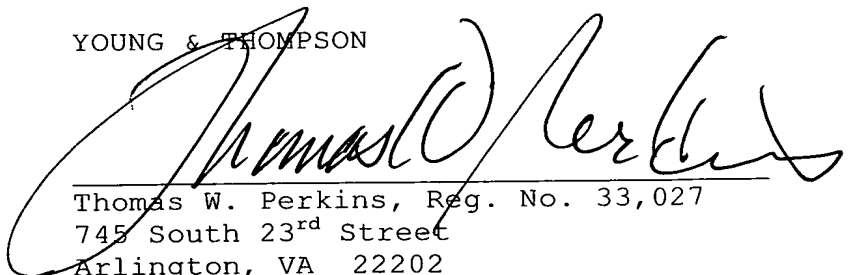
New claim 15 has been added. Consideration and allowance of claim 15 are respectfully requested for the reasons given above.

In view of the present amendment and the foregoing remarks, it is believed that the present application has been placed in condition for allowance. Reconsideration and allowance are respectfully requested.

The Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 25-0120 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17.

Respectfully submitted,

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**APPENDIX:**

The Appendix includes the following item(s):

- ☐ - a terminal disclaimer
- ☐ - a 37 CFR 1.132 Declaration
- ☐ - a new or amended Abstract of the Disclosure
- ☐ - a Replacement Sheet for Figure                of the drawings
- ☐ - a Substitute Specification and a marked-up copy of the  
originally-filed specification
- ☐ - a verified English translation of foreign priority document
- ☒ - two sheets of explanatory drawings